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Economic Impact of Civil Aviation on the U. S. Economy Update 2002

Interim Results

J. Robbins Tucker

Air Traffic Control Association (ATCA) Conference - July 9, 2002

ASD-300 - NAS Programming and Financial Management
Federal Aviation Administration

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A Sequence of Six Studies

- 1989
- 1990
- 1993
- 1995
- 2000
- 2002

This work was **originally sponsored in 1988 by an industry group called the Partnership for Improved Air Travel** and I (Rob Tucker) have been directing **updates since 1990** when **Maury Wilber brought it to my attention** as **one of several methods** of maintaining a knowledge, within my organization, of the health and importance of the industry.

Maury has continued to organize and lead 5 updates by the original firm (Wilbur Smith Associates, an international transportation and civil engineering and economics company) since then.

The fifth is underway and is the subject of this presentation as well as an **international perspective provided by ARINC**. **Copies, or the electrons, of this presentation will be available … and can be requested** from contact info I'll give you later.
Your inputs, comments, advice, or criticisms are welcome. Please provide them to one of contacts on the last slide of this briefing.
Wilbur Smith (WSA's 1952 founder) and Maury Wilber are no relation, just coincidentally similar first and last names.

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Study Purpose

To provide a quantitative understanding of the role of Civil Aviation in the U.S. economy.

- **Airline Services**
- **General Aviation**
- **Civil Airport Ops.**
- **Aircraft Mfg.**
- **Aviation Passengers**
  - Hotels
  - Food & beverage
  - Entertainment, etc.

This series of studies uses conventional and accepted Department of Commerce developed methods to quantify the economic value of financial transactions that are associated directly or indirectly with aviation.

The study traces this flow of funds through the economy, and identifies which industry types benefit, and by how much.

Civil Aviation includes the five elements listed here including passengers as one of those elements as measured by the collateral demand they make as they undertake air travel,

…being all-inclusive, in that we include over 18,000 civil airports in the U.S., and every aviation participant.

Study Objectives

- **Estimate Annual Impacts in Terms of**
  - Total Expenditures
  - Earnings
  - Jobs
- **Compare Impacts With GDP**
  - Commercial Aviation
  - General Aviation
  - Aircraft Manufacturing
- **Evaluate Effects of September 11th**

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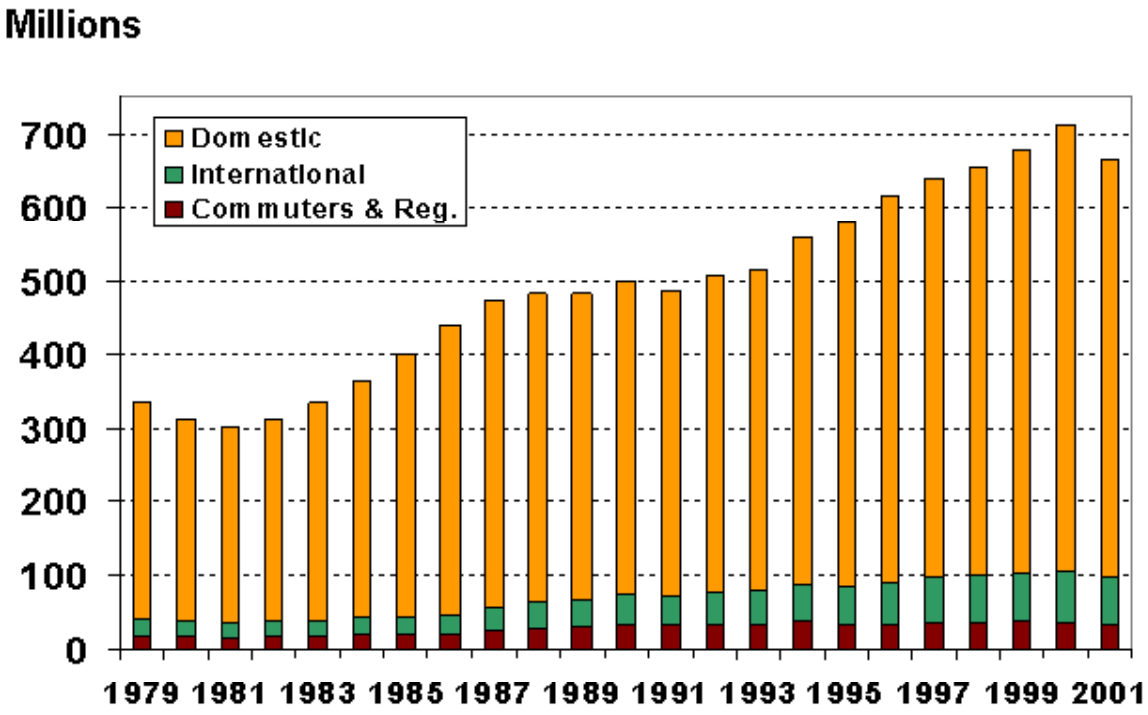
U.S. Enplanements



Source: FAA Aerospace Forecasts, includes all U.S. certified and foreign flag carriers

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As with all demand, commercial passenger **demand begins with people, measured as "enplanements**". Growing 46% 1991-2000. The airline expenses associated with transporting people comprise a major share of the aviation impacts, as do the associated visitor expenditures

In 2000, the **commercial aviation industry in the U.S. includes: over 400 airports** with scheduled airline service and another 100+ with unscheduled service; over 60 air carriers; over 20 all-cargo air carriers; 710 million annual passenger enplanements; plus **countless hotels, rental car agencies and other firms** which serve air passengers.

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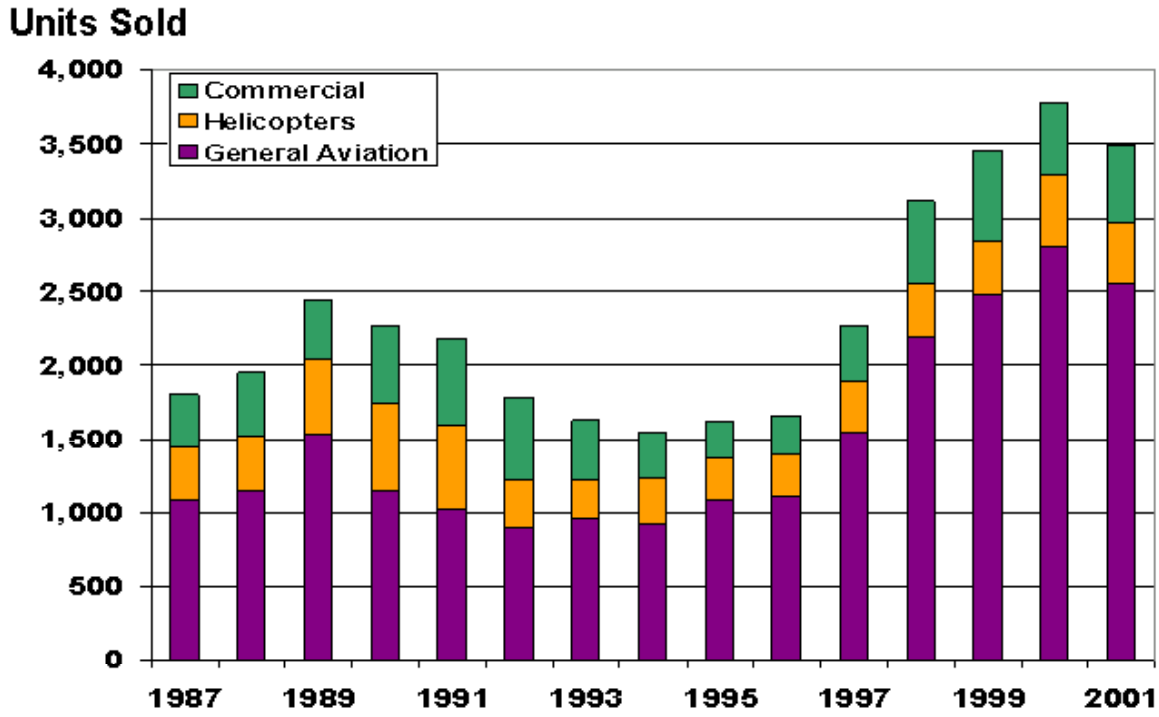
U.S. Aircraft Manufactured



Source: Aerospace Industries Association, GAMA, and US Census Bureau - Current Industrial Reports

Civil aircraft manufacturing also generates significant economic impacts. Between 1996 and 2000, total civil aviation aircraft produced by U.S firms rose 127% from 1662 to 3780 aircraft - an increase in all types.

The largest increase occurred in GA aircraft, led by the business jet market, with 2,802 sold in 2000, up 151% from 1996.

The value of those aircraft sales rose 86% from $20.8 to 38.6 billion.

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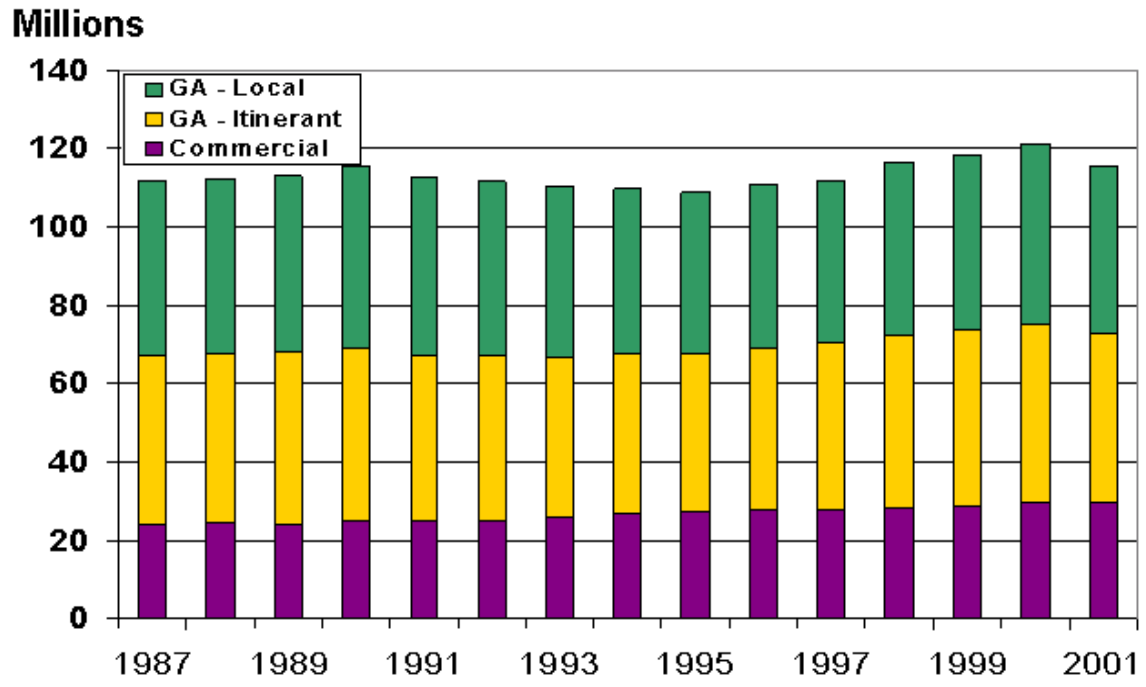
U.S. Aircraft Operations



Source: FAA Policy and Plans

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Aircraft Operations are also an important indicator of economic health. Through commercial passenger enplanements and airline operating expenses we are able to tract the impacts associated with airline operations and visitor impacts.

To quantify the impacts associated with General Aviation, past individual airport economic impact studies are analyzed. Through these studies a strong correlation between itinerant GA operations and impacts has been identified. Impact per operation ratios can therefore be used to estimate the national level of GA impacts.

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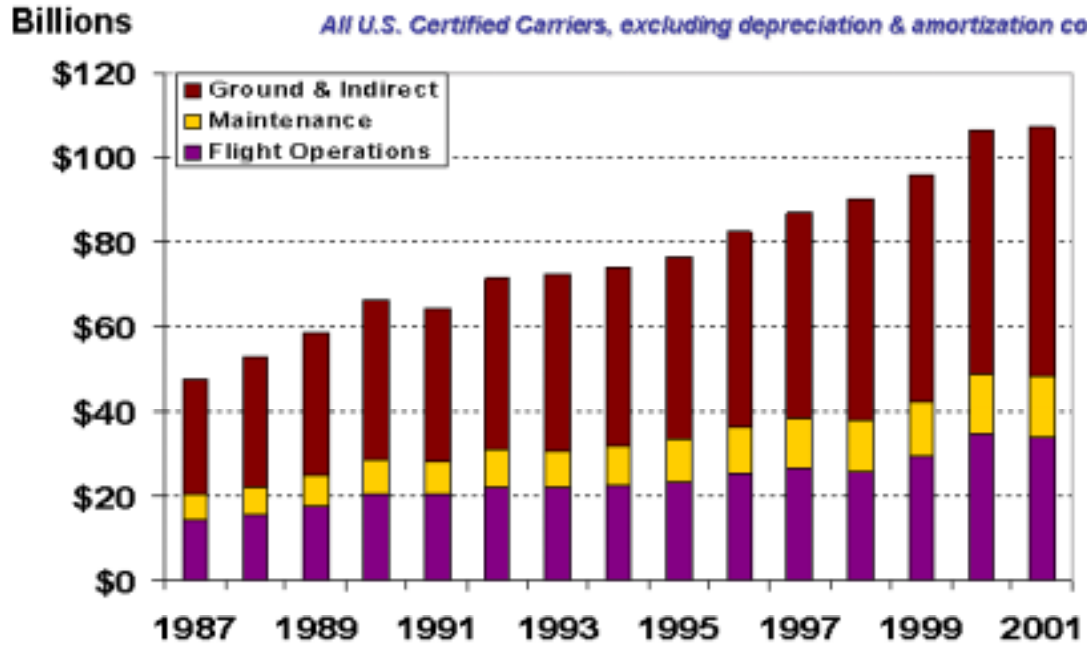
U.S. Airline Operating Expenses



Source: Air Carrier Financial Statistics, Bureau of Transportation Statistics

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As mentioned, airline operating expenses are an important measure of the economic activity associated with commercial passenger as well as cargo service.

The impacts tabulated include operating expenses for the Majors (15), Nationals (37) and Regionals (40), as well as the small certified and commuter carriers. Amortization and depreciation expenses, however, are excluded because they reflect impacts associated with aircraft manufacturing, which are tabulated separately.

The nation's **10 largest airlines** alone spend close to **$250 million a day,** and a majority of those costs continue even if the planes are grounded. ("Air Attack on Pentagon Indicates Weakness", Newsday.com, September 23, 2001 newsday.com/news/nationworld/nation/ny-uspent232380681sep23.story

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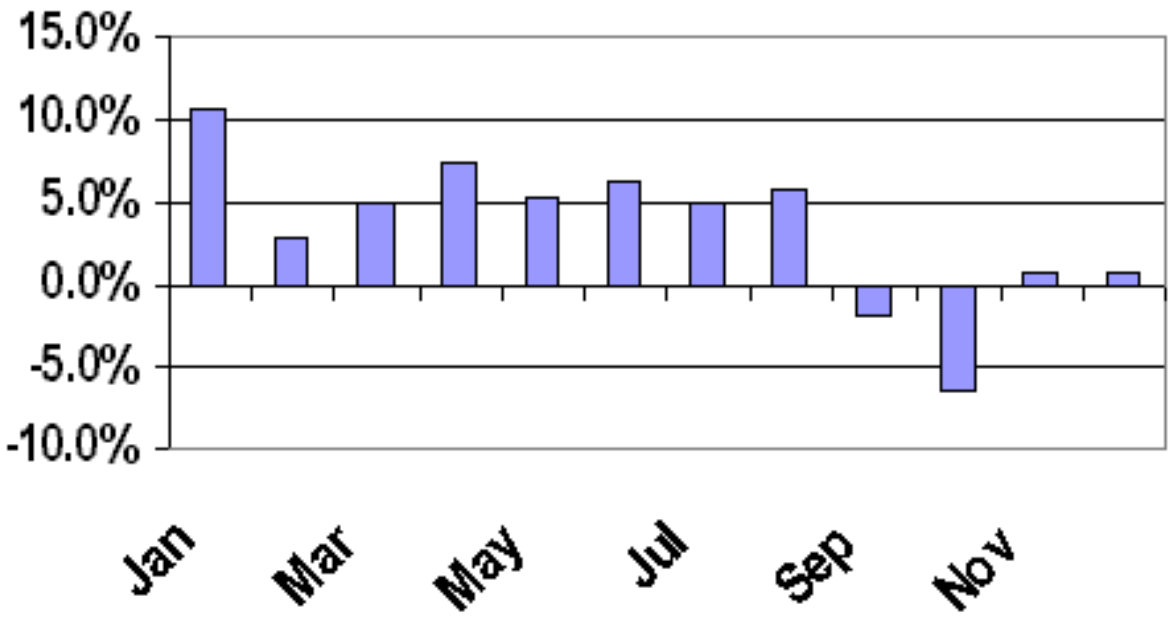
European Regional Airline Passenger Growth - 2001



Source: European Regional Airlines Association: ERA Performance Report -April 2002

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Definitions

Four Economic Measures

- **Economic Activity (Output)**
  - Total Expenditures
  - Multiplier for the “Ripple Effects” Called “Induced” Impacts
- **Earnings**
  - Wages & Salaries
- **Jobs**
- **GDP**
  - All Value-added Components of the Economy Rents, Capital Gains, Interest.

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1.) "Economic Activity" Economic Activity represents the **sales value of goods and services demanded by a chain of effects** from the selected starting point (air transportation in this case) and the related travel businesses to and through a long chain of industries that are sustained by the initial demand for air travel, the workforce they sustain, as well as the expenditure of salaries and wages of the that work force.

2.) "Earnings" are the **sum of wages and salaries to all employed persons that the aviation industry pays directly, indirectly or due to mulitplier estimates**. Earnings Impact are always included in the Economic Activity totals, so should not be summed with the Economic Activity Impact. Earnings are also a conservative proxy for "value added”.

3.) "Jobs" equal the number of employees who are employed in the **aviation industry,** plus the **aviation oriented** share of those that are employed in sectors that support the air passenger (hotels, restaurants, etc.) plus **those employed in the industries included in the multiplier derived industries.** The number of jobs attributable to an industry is always greater than simply those in the industry itself, due to the "re-spending" of those wages.

4.) “GDP”: To compare aviation's impact to GDP, an impact measure must **only include the value-added components, but more of those than just earning (listed)**. The “Earnings” impact measure does so, it includes wages & salaries, other labor income, and proprietor’s income -- all of which are components of total personal income as reported in the Department of Commerce National Accounts.
Il will be discussing the economic effects of the 9/11 events as estimated by these measures.

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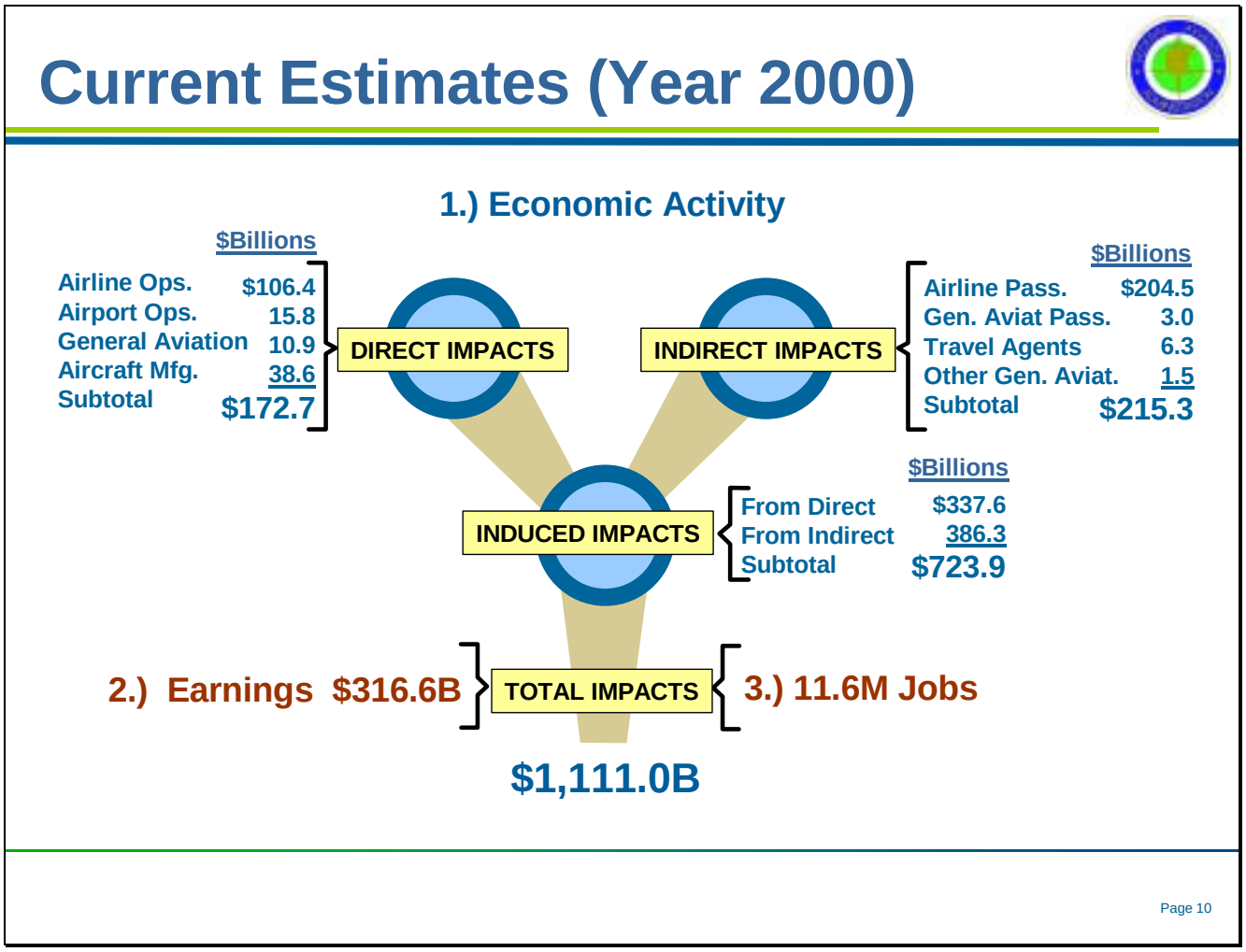

Direct impacts are those financial transactions that occur due as a result of air passenger and air cargo services, and of the supply of new aircraft. They include expenditures by airlines, airport tenants, air cargo firms, fixed base operators (FBO's), ground transport firms, flight schools, airport concessions, aircraft manufacturing and others involved in **directly supplying** of aviation products and services.

Indirect impacts are those transactions that are **not strictly aviation**, but occur due to the simultaneously with the demand for aviation. They include expenditures by visitors who arrive by air, expenditures **for travel agents, hotels, etc**. (expenditures by business aviation and others).

Induced impacts result from direct and indirect impacts. Multipliers are estimates of the **total changes in output by other industries caused by the demand for air travel and indirect concurrent activity**. The full 38 row by 490 column D.O.C. RIMS-II model is used to enable the results **from 18,620 inter-industry activity relationships** modeled for each direct and indirect impact.

3 of our 4 measures are shown here. I'll get to the 4th on the next page.

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Aviation & GDP – Year 2000

A Fourth Measure:

Impact Type	GDP Contribution (Billions)	Percent of GDP
Direct	$171.8	1.7%
Indirect	215.4	2.2%
Induced	126.4	1.3%
Total	$513.5	5.2%
U.S. Total GDP	*$9,872.9*[1]	*100%*

[1]Source: Survey of Current Business, August, 2001

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So here are our "walking around" numbers. While I hear media reports that aviation makes up 10% or more of the economy, I don't know what those represent. The US economy is a very big animal. We find that at 5.2%, aviation is still very significant. Especially when you think of that as 12M jobs!

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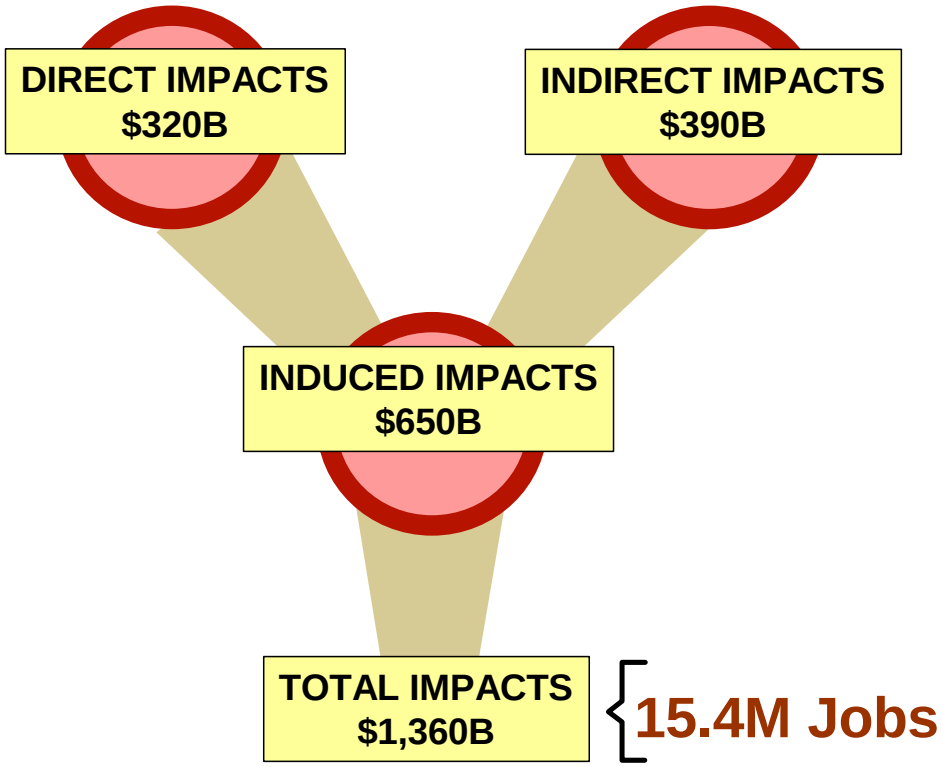
Air Transport Impact on World Economy



Source: Air Transport Action Group, Economic Benefits of Air Transport, 2000 Edition

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We will now turn to the how these measures are affected by the September 11 attacks on the U.S. and how the recovery looks from this perspective.

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U.S. Commercial Aviation in Sept.

For September

- **Enplanements Down 51%** (BTS)
- **Average Domestic Airfare Down 18%** (ATA)
  - Business Airfare Down 15%
  - Coach Airfare Down 19%

BTS: Bureau of Transportation Statistics
ATA: Air Transport Association

With the first time ever total airspace system shutdown in September, the immediate effect, as measured for the month of September as a whole is that not only the enplanements count is down over 50%, but the average airfare is also off another 15-19% for a compounded effect of about 60%.

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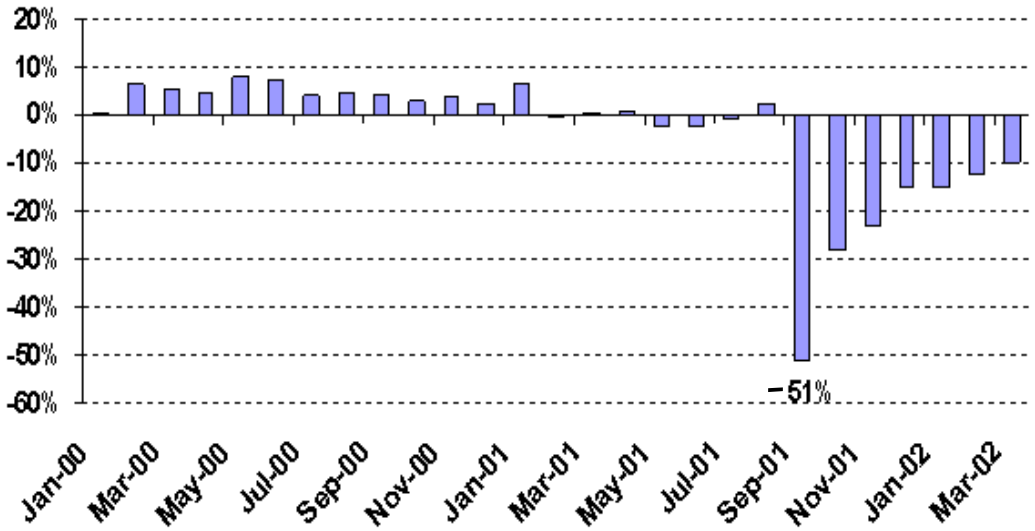
U.S. Change in Enplanements

Year-Over-Year Monthly Change



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As I said earlier, commercial passenger aviation demand begins with enplanements. So we look at the activity leading up to and beyond 9/11 taking one somewhat creative step to make an effort to consider the concurrent economic slowdown, accounting for a relatively insignificant, additional decline in enplanements.

Here we see the monthly enplanement numbers bubbling along at a nice annual rate of about 4.6% Until Feb. 01, then flattens out, then 2-3 negative months as the mild recession or ”slow down” sets in just before September.

Even though there is an up-tick in August, we know that generally, the slowdown continued for sometime afterward.

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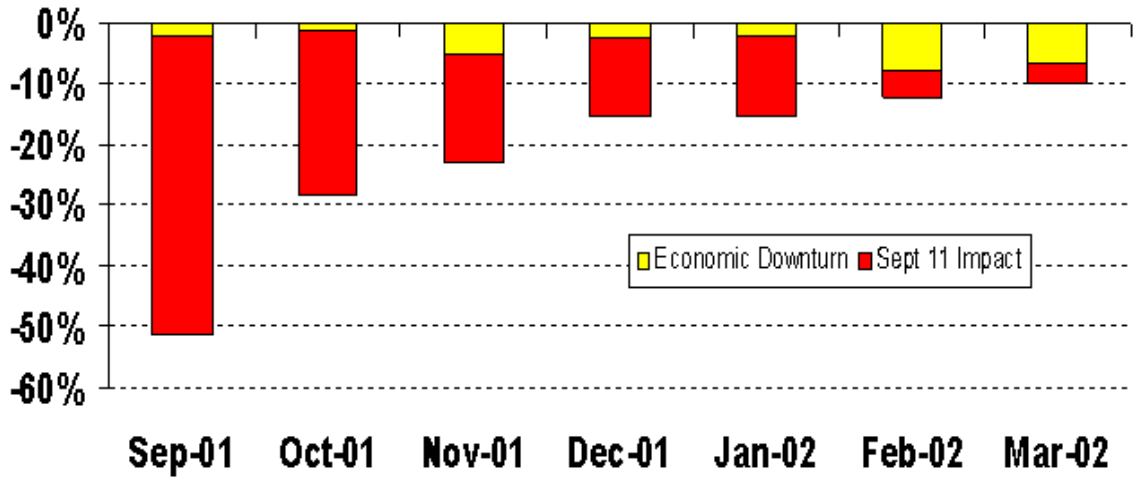
U.S. Enplanements, by Effect



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On this Chart we have the total actual enplanements fall-off in rates of change over the Year-to-Year monthly change - with the estimated economic effect laid in based on the same coinciding months, for seasonal consistency, of the enplanement rate of changes from the last recession in 1991.

The data is:

Economic effect	**- 1.7%**
9/11 effect	**- 49.5%**
Total September	**- 51.2%**

Recovery from September level is around 90% (89.55%) pending potential revisions after more study of the comparable duration vs. intensity of the 1991 slowdown used to model the 2001-2002 slowdown and represented in these numbers.

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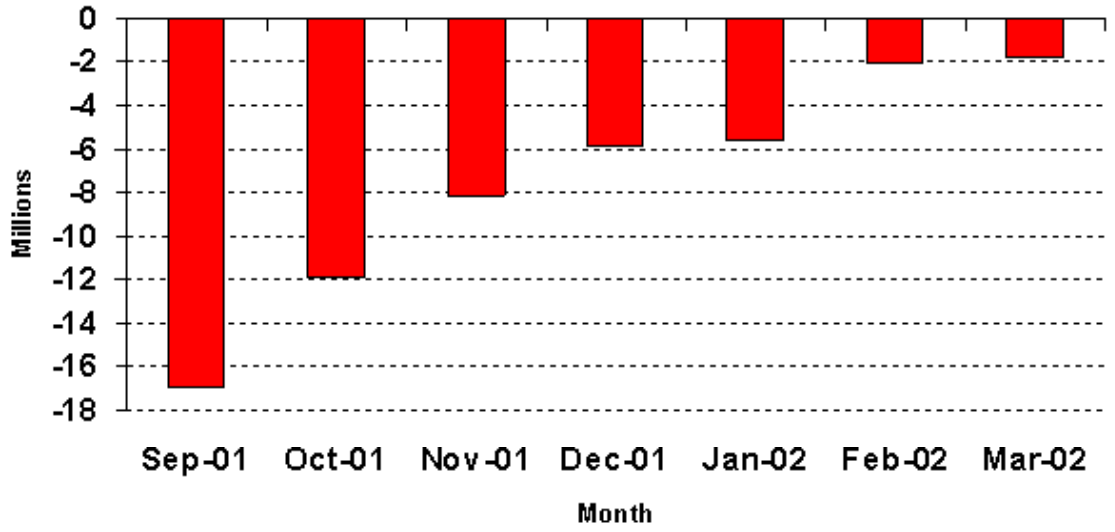
U.S. Enplanements Due to September 11



A Total of 52.3 Million Enplanements Lost

17M to 1.8M enplanements (93.3%)

52.3M total
70% in the first 3 months.

Last 10% to 5% proving somewhat more stubborn so far.

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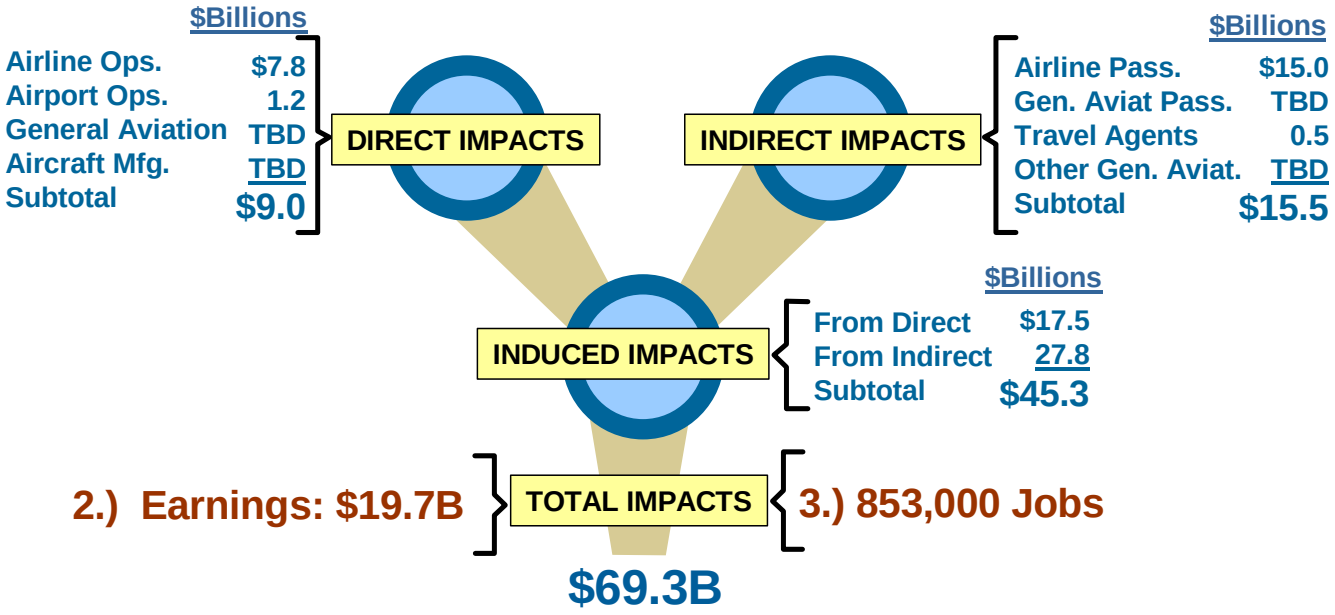
U.S. Economic Impacts of Sept. 11

Commercial Aviation Impacts - $Billions

1.) Economic Activity



4.) GDP Equivalent: $32.5B (0.3%)

TBD: To Be Determined

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In some detail, you can see all four estimated measures by element.

General Aviation, Manufacturing, and Air Freight will be estimated later this year.

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Bad Times for Airlines Ripple Across the Economy
Airline Headcount Reduced (Initially) by ~95,000

	Examples of Net U.S. Jobs Lost (000) 2001	2002
Eating & Drinking Places	-18.0	- 150.6
Hotels & Motels	- 49.2	- 140.6
Miscellaneous Amusement & Rec. Services	- 33.0	- 100.4
Air Transportation, Scheduled	- 46.2	- 85.9
Advertising	- 13.3	- 79.3
Theatrical Producers, Bands & Rec. Services	- 10.5	- 52.8
Aircraft & Parts	- 3.4	- 42.4
Airports & Airport Terminal Facilities	- 10.0	- 19.2
Fire, Marine & Casualty Insurance	- 4.8	- 17.4
Life Insurance	- 9.3	- 17.0
Arrangement of Passenger Transport	- 7.6	- 10.3
Museums & Art Galleries	- 5.1	- 9.3

Source: Milken Institute, "Metropolitan Economies in the Wake of 9/11," January 11, 2002

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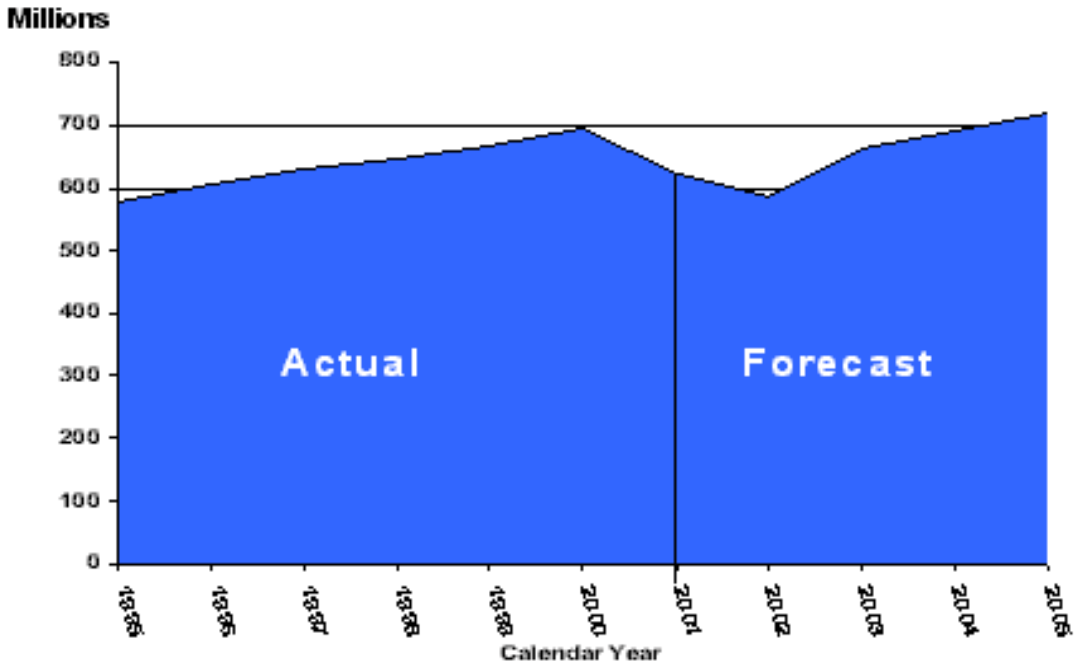
U.S. Commercial Enplanements CY 1995 - 2005



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U.S. Recovery

Percent of September Loss Rate Recovered

by March 2002

90%

The good news is, again proving the strength and resiliency of the U.S. economy as seen in the economic activity – at least on the average – activity **is near fully recovered.**

The balance of this year's update will on identifying un-evenness in the recovery and determine for the first time, the contribution by the rapidly growing Air Freight segment.